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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/806,590

03/22/2004

Tai-Cherng Yu

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25859 7590 06/29/2007
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FOXCONN INTERNATIONAL, INC.
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EXAMINER

RAYMOND, BRITTANY L

ART UNIT

PAPER NUMBER

1756

MAIL DATE

DELIVERY MODE

06/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/806,590

Applicant(s)

YU ET AL.

Examiner

Brittany Raymond

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/4/2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The use of the phrase, "the series of photo mask processes including enough such photo mask processes so as to yield a plurality of respectively approximately half sphere-shaped recesses," is confusing for several reasons. It is unclear as to how many processes is "enough" and what shape would be "approximately half sphere-shaped." It is also confusing as to what the "plurality of respectively approximately half sphere-shaped recesses" is referring to. This could be taken to mean that each step-wise recess could have a half sphere shape rather than all of the step-wise recesses together forming a half sphere-shaped recess.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 1756

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1, 4, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otthofer (U.S. Patent 3907622) in view of Makigaki (U.S. Patent 6863375).

Otthofer discloses an etching process comprising: placing a photographic resist material over a metal plate, exposing and developing the resist material using a negative to form a pattern, etching the metal plate by using the resist pattern as a mask, and performing the process several times (Column 3, Line 46 – Column 4, Line 30), as recited in claim 1 of the present invention. It is apparent from Figure 3, that each of the recesses becomes narrower and deeper within the prior recess, as recited in claims 1 and 9 of the present invention. Since a different negative is being used for photolithography process, this means that the negative is aligned each time prior to exposure, as recited in claim 4 of the present invention.

Shu fails to disclose that each of the stepped recesses is cylindrical and that they form overall approximately half sphere-shaped recesses.

Makigaki discloses a method of making an ejection device that uses a nozzle for ejection of a liquid or a gas (Column 1, Lines 12-14). Makigaki states that the nozzle has a stepwise cross-section, with a small cross-sectional circular nozzle portion and a large cross-sectional circular nozzle formed around it (Column 6, Lines 47-53 and Figure 2). It would be known by one of ordinary skill in the art that if the cross-section of the different parts of the nozzle are circular, that when etched into the layer they are

Art Unit: 1756

formed in, they will be cylindrical in shape, as recited in claim 1 of the present invention. The nozzles are made by using a photolithography procedure including the use of photoresist exposure (Column 3, Lines 17-37).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have formed cylindrical recesses in the base plate, as suggested by Makigaki, in the process of Otthofer because Makigaki teaches that different shapes, such as cylinders, can be formed within one another. It also would be obvious to one of ordinary skill in the art, that if cylindrical recesses were formed within one another by the process of Otthofer, an approximately half sphere-shaped recess would be formed.

5. Claims 3, 5-8, and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otthofer (U.S. Patent 3907622) in view of Makigaki (U.S. Patent 6863375) as applied to claims 1, 4, and 9 above, and further in view of Andresakis (U.S. Patent 6606792).

The teachings of Otthofer and Makigaki have been discussed in paragraph 4 above.

Otthofer and Makigaki fail to disclose that each photolithography step comprises covering a base plate with resist, forming a mask, forming patterns in the resist by exposing the resist through the mask, etching the base plate to get cylindrical recesses, and cleaning the resist film and other particles from the base plate, that the base plate is made of nickel or nickel alloy, that the resist film comprises a resist and an organic polymer, and that the resist film can be positive or negative.

Andresakis discloses a process for forming a printed circuit substrate comprising: depositing a layer of impedance material on a sheet of highly conductive material and then attaching the other side of the conductive material to a support, which forms a base plate (Column 6, Lines 54-57), applying a layer of photoresist on top of impedance layer (Column 6, Lines 58-59), exposing the photoresist layer to actinic radiation through a mask (Column 8, Lines 49-51), developing the photoresist to form a pattern (Column 8, Lines 61-62), etching the impedance material by contacting the material with an etchant and using the photoresist layer as a mask (Column 9, Lines 16-22), and removing the photoresist (Column 10, Lines 26-28), all of which are recited in claims 3 and 10 of the present invention. Andresakis also discloses that the conductive material can be made of nickel (Column 6, Lines 61-63) and that the impedance material can comprise nickel or a nickel containing alloy (Column 7, Lines 4-5), as recited in claims 5 and 12 of the present invention. Andresakis also discloses that the photoresist film composition may include mixtures of o-quinone diazides with an aqueous alkali soluble binder resin (Column 7, Lines 60-62), which is an organic polymer mixed with a resist, as recited in claims 6 and 13 of the present invention. Andresakis states that the photoresist may be positive or negative working (Column 7, Line 38), as recited in claims 7, 8, 14, and 15 of the present invention.

Ottofer teaches every limitation of dependent claim 11 of the present invention, in paragraph 4 above.

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have followed the photolithography process, as suggested by

Andresakis, to form the plurality of cylindrical recesses of Otthofer and Makigaki because Andresakis teaches that this process is a typical photolithography process for etching into base plates. It also would have been obvious to one of ordinary skill in the art, to have used the types of base plate and photoresists, as suggested by Andresakis, in the processes of Otthofer and Makigaki because Andresakis teaches that these types of materials are common for a typical photolithography etching process.

Response to Arguments

6. Applicant's amendments and arguments, filed 4/13/2007, have been fully considered and are persuasive. Therefore, all rejections in the previous Office Action have been overcome. However, in view of the amendments, a new ground(s) of rejection is made in view of the references, Otthofer, Makigaki, and Andresakis, which has overcome the arguments by Applicant.

The combination of Otthofer and Makigaki teach a plurality of cylindrical recesses being formed into a base plate, each recess being deeper and narrower. If the cylindrical recesses of Makigaki are formed by the process of Otthofer, this is following the same process as recited in the claims of the present invention, and would result in an approximately half sphere-shaped recess.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1756

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

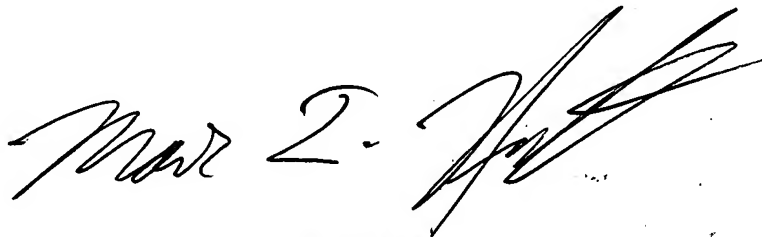
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brittany Raymond whose telephone number is 571-272-6545. The examiner can normally be reached on Monday through Friday, 8:00 a.m. - 4:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1756

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, appearing to read "Mark F. Huff", with a stylized flourish at the end.

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700